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REMARKS

Claim 1 has been amended to more clearly define Applicant's invention. In particular, this claim recites that the non-ionic surfactant is in an amount of between about 5% and 20% based on the total weight of the dispersant composition and that the polymer comprising at least one salt of a carboxylic acid group is in an amount between about 3% and 25% by weight based on the total weight of the dispersant composition, which is more consistent with the present disclosure (see paragraph [0019]). In addition, claims 22 and 31 have been amended to recite that the polymer comprising at least one salt of a carboxylic acid group is soluble in water, to be more consistent with claim 1. No new matter has been added. Thus, claims 1, 3-6, 10-12, 18-22, 24-35, and 37-41 are pending.

Rejection of Claims under 35 U.S.C. § 112

Claims 1, 3-6, 10-12, and 18-21 have been rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

In paragraph 6, the Office Action states that the claim(s) contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In particular, the Office Action notes that claim 1 recites that the amount of the non-ionic surfactant is between about 3% and 25% based on the total weight of the dispersant composition and that the amount of the polymer comprising at least one salt of a carboxylic acid group is between about 5% and 20% based on the total weight of the dispersant composition. However, the Office Action states that this is considered new matter since the specification discloses that the amount of non-ionic surfactant is typically between about 5% and 20% (not between about 3% and 25%) and the amount of polymer comprising at least one salt of a carboxylic acid group is generally between about 3% and 25% (not between about 5% and 20%).

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In response, Applicant has amended claim 1 to recite that the amount of non-ionic surfactant is between about 5% and 20% and the amount of polymer comprising at least one salt of a carboxylic acid group is between about 3% and 25%, both based on the total weight of the dispersant composition, as described in the present specification (see paragraph [0019]).

Therefore, Applicant believes that claims 1, 3-6, 10-12, and 18-21 comply with the written description requirement and respectfully request that the rejection of these claims under 35 U.S.C. § 112, first paragraph be withdrawn.

Rejection of Claims under 35 U.S.C. § 103

Martin et al.

Claims 1, 3-6, 10-12, and 18-21 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Martin et al. (U.S. Patent Application Publication No. 2003/0191231, now U.S. Patent No. 7,022,759).

In paragraph 8, the Office Action states that Martin et al. discloses aqueous ambient crosslinkable and shelf stable polyester polymer compositions which provide coatings having improved open and wet edge times as well as good tack-free times. Regarding component (ii) recited in present claim 1, the Office Action states that Martin et al. discloses that the crosslinkable polyester oligomer(s) preferably contains a sufficient concentration of bound hydrophilic water-dispersing groups (such as non-ionic water-dispersing groups including polyalkylene oxide groups) that are capable of rendering the oligomer self water-dispersible, but the concentration of such groups is preferably not so great that the oligomer has an unacceptably high water solubility in order to not compromise the water sensitivity of the final coating. The Office Action further states that Martin et al. discloses many examples of carboxylic acid groups (or their ester forming derivatives) that can be used in polyester oligomer(s) synthesis for providing an acid component. The Office Action concludes that this can be considered to be component (ii) recited in present claim 1.

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The Office Action further states that, while Martin et al. does not disclose the amount of component (ii), the discovery of optimum values of a result effective variable in known processes is ordinarily within the skill of the art and would have been obvious.

Regarding component (i) recited in present claim 1, the Office Action states that Martin et al. discloses that surfactants and or high shear can be utilized in order to assist in the dispersion of the polyester oligomer(s) in water (even if the oligomer(s) is self-dispersible), and suitable surfactants include conventional anionic, cationic, and/or non-ionic surfactants, such as polyglycol ether compounds and polyethylene oxide compounds. The Office Action adds that the amount used is preferably 0-15% by weight, which is mostly within the presently claimed range. The Office Action concludes that this can be considered to be component (i) recited in present claim 1.

Applicant respectfully disagrees. Claim 1 recites a dispersant composition comprising i) at least one non-ionic surfactant in a specified amount and ii) at least one polymer comprising at least one salt of a carboxylic acid group in a specified amount. The non-ionic surfactant is a polyalkylene oxide that is insoluble in water, and the polymer comprising at least one salt of a carboxylic acid group is soluble in water. Thus, the dispersant composition of present claim 1 comprises both a water soluble polymer having a carboxylic acid salt group - component (ii) - and a water insoluble polyalkylene oxide - component (i).

To summarize the discussion provided in paragraph 8 of the Office Action regarding Martin et al., the crosslinkable polyester oligomer(s) has been identified as component (ii) - i.e., the water soluble polymer having at least one salt of a carboxylic acid group. Also, polyglycol ether and polyethylene oxide compounds described in Martin et al. as external surfactants that can be used in combination with this crosslinkable polyester oligomer(s) have been identified as component (i) - i.e., the water insoluble non-ionic surfactant.

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However, while the components of Martin et al. have been identified in this way, Applicant believes that the dispersant composition recited in present claim 1 is patentable over this combination of materials. In particular, while Martin et al. teaches a crosslinkable polyester oligomer(s) that "preferably contains a sufficient concentration of bound hydrophilic water-dispersing groups" such as "ionic water-dispersing groups", preferably, a carboxylic acid group (see paragraphs [0062]-[0064] and [0078]), and that this material "may be completely water soluble" or "only have partial solubility in water" (see paragraph [0061]), there is no disclosure, teaching, or suggestion of the use of this oligomer(s) with a polyalkylene oxide that is water insoluble. The polyglycol ethers and polyethylene oxide compounds identified in the Office Action are taught by Martin et al. to be "external surfactants" that are used, if needed, "to assist in the dispersion of the polyester oligomer(s) in water" (see paragraph [0085]). Based on this description, one of ordinary skill in the art would not consider this material to be water insoluble, and Martin et al. does not disclose or even suggest that this is so. Rather, as an external surfactant used to disperse the polyester oligomer(s), it would be the polyester oligomer(s) that would be considered to be water insoluble to some degree, and the external surfactant would be water soluble in order to "assist in the dispersion" of the oligomer(s) in water.

Therefore, even considering the crosslinkable polyester oligomer of Martin et al. to be the water soluble polymer having at least one carboxylic acid group recited in present claim 1, Applicant believes there is no disclosure, teaching, or suggestion anywhere in this reference of the use of this material in combination with a water insoluble polyalkylene oxide, and this reference does not reasonably suggest the use of such a combination as a dispersant composition. In fact, Martin et al. may be said to teach away from this combination, since the only need for an external surfactant would be when the oligomer(s) is not water soluble, and, in this case, a water soluble external surfactant, such as a polyethylene oxide would be used.

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In addition, regarding the amount of the external surfactant, Applicant notes that Martin et al. teaches that the surfactant is preferably used in an amount of 0-15% by weight based on the weight of the crosslinkable polyester oligomer(s) (see the last sentence of paragraph [0085]). By comparison, the amount of the water insoluble polyalkylene oxide recited in present claim 1 is 5-20% based on the total weight of the dispersant composition. Thus the amount of the external surfactant taught by Martin et al. is very different and well outside the range of the amount of component (i) recited in the present claims.

Therefore, Applicant believes that claim 1 is patentable over Martin et al. since this reference does not disclose, teach, or suggest the combination of a polyalkylene oxide which is insoluble in water and a polymer comprising at least one salt of a carboxylic acid group which is soluble in water, particularly in the recited amounts. In addition, claims 3-6, 10-12, and 18-21, which depend directly or indirectly from claim 1, recite further embodiments of the present invention and, for at least the reasons discussed above, are also patentable over Martin et al.

Applicant therefore believes that claims 1, 3-6, 10-12, and 18-21 are patentable over Martin et al. and respectfully request that the rejection of these claims be withdrawn.

Martin et al. in view of Belmont

Claims 22, 24-35, and 37-41 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Martin et al. (U.S. Patent Application Publication No. 2003/0191231, now U.S. Patent No. 7,022,759) as applied to claims 1, 3-6, 10-12, and 18-21 above and further in view of Belmont (U.S. Patent No. 5,672,198).

In paragraph 9, the Office Action states that the disclosure concerning Martin et al. from paragraph 8 is incorporated herein by reference. In addition, the Office Action states that this reference discloses that the aqueous coating composition may contain conventional ingredients including pigments, dyes, emulsifiers, plasticizers, thickeners, and other additives, but Martin et al. does not disclose the claimed limitations for the pigment and the pigment composition.

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However, the Office Action further states that Belmont discloses aqueous ink compositions which include a modified carbon product comprising carbon having attached at least one organic group that is substituted with an ionic or an ionizable group, and that a coating composition comprising water, a binder, and this modified carbon product is also described. The Office Action concludes that it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate, as the pigment, a modified carbon product having attached at least one organic group as taught by Belmont in Martin's aqueous polymeric composition because, in contrast to conventional carbon pigments, the modified carbon products for use in the ink or coating of the present invention are not difficult to disperse in an aqueous vehicle, do not necessarily require a conventional milling process, and do not necessarily need a dispersant in order to attain a usable ink or coating, and because the modified carbon products only require low shear stirring or mixing to readily disperse in water, thus arriving at the subject matter of the present claims.

Applicant respectfully disagrees. Regarding claims 22 and 24-30, claim 22 recites a pigment composition comprising a) at least one pigment, and b) at least one dispersant composition comprising i) at least one non-ionic surfactant and ii) at least one polymer comprising at least one salt of a carboxylic acid group. Regarding claim 31-35 and 37-41, claim 31 recites an aqueous coating composition comprising a) an aqueous vehicle comprising a water-based resin and an aqueous solvent, b) at least one pigment, and c) at least one dispersant composition comprising i) at least one non-ionic surfactant and ii) at least one polymer comprising at least one salt of a carboxylic acid group. For both of these claims, the non-ionic surfactant is a polyalkylene oxide that is insoluble in water, and the polymer comprising at least one salt of a carboxylic acid group is soluble in water. Thus, the dispersant composition recited in claim 22 and claim 31 is the dispersant composition recited in claim 1 and comprises both a water soluble polymer having a carboxylic acid salt group - component (ii) - and a water insoluble polyalkylene oxide - component (i).

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As discussed in more detail above, Applicant believes this dispersant composition is patentable over Martin et al. since this reference does not disclose, teach, or suggest the combination of a polyalkylene oxide which is insoluble in water and a polymer comprising at least one salt of a carboxylic acid group which is soluble in water, even considering the crosslinkable polyester oligomer(s) to be component (ii) and the external surfactant discussed in Martin et al. to be component (i).

Furthermore, Belmont cannot cure this deficiency of Martin et al. As discussed in the Office Action, Belmont discloses aqueous inks and coatings comprising a modified carbon product comprising a carbon having attached at least one organic group that is substituted with an ionic group or ionizable group. However, there is no disclosure, teaching, or suggestion anywhere in Belmont of the use of a dispersant composition comprising both a water insoluble polyalkylene oxide and a water soluble polymer comprising at least one salt of a carboxylic acid group. Rather, as is also noted in the Office Action, Belmont states that the modified carbon products "are not difficult to disperse in an aqueous vehicle" and that dispersants are not necessarily needed to attain a usable ink or coating (see column 3, lines 17-27).

Applicant therefore believes that the pigment composition of claim 22 and the coating composition of claim 31 are patentable over Martin et al. in view of Belmont since these references, in combination, do not teach or suggest a pigment composition or a coating composition comprising a dispersant composition having the recited components and further comprising a modified carbon product comprising a carbon product having attached at least one organic group. In addition, claims 24-30, which depend directly or indirectly from claim 22, and claims 32-35 and 37-41, which depend directly from claim 31, recite further embodiments of the present invention and, for at least the reasons discussed above, are also patentable over this combination of references.

Therefore, Applicant believes that claims 22, 24-35, and 37-41 are patentable over Martin et al. in view of Belmont and respectfully request that the rejection of these claims be withdrawn.

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Mazanek et al.

Claims 1, 3-6, 10-12, and 18 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Mazanek et al. (U.S. Patent No. 5,266,622).

In paragraph 10, the Office Action states that Mazanek et al. discloses that aqueous dispersions of fillers and/or pigments contain a dispersant combination of A) 40-95% by weight of a water-soluble polymer, which can preferably be homopolymers and copolymers of methacrylic and/or acrylic acid and their salts, including ammonium salts, and B) 0-60% by weight of a non-ionic alkylene oxide adduct having an average molecular weight of 200-100,000, wherein component B is preferably present in up to 10-40, in particular 20-30% by weight, which overlaps the range in present claim 1.

The Office Action further states that, while Mazanek et al. does not disclose the amount of component (ii), the discovery of optimum values of a result effective variable in known processes is ordinarily within the skill of the art and would have been obvious.

Applicant respectfully disagrees. Claim 1 recites a dispersant composition comprising i) at least one non-ionic surfactant in a specified amount and ii) at least one polymer comprising at least one salt of a carboxylic acid group in a specified amount. The non-ionic surfactant is a polyalkylene oxide that is insoluble in water, and the polymer comprising at least one salt of a carboxylic acid group is soluble in water. Thus, the dispersant composition of present claim 1 comprises both a water soluble polymer having a carboxylic acid salt group – component (ii) – and a water insoluble polyalkylene oxide – component (i).

By comparison, while Mazanek et al. describes combinations of dispersants that, in some embodiments, include a water-soluble polymer (component A) and a non-ionic alkylene oxide adduct (component B), there is no disclosure, teaching, or suggestion anywhere in this reference that the non-ionic alkylene oxide adduct can or should be water insoluble (see column 3, lines 6-56 as well as the Examples for descriptions of component B). The only discussion in Mazanek et al. that relates to how to choose the desired component B is based on viscosity measurements (see column 4, lines 50-52), which would be considered to be for soluble components.

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Furthermore, Mazanek et al. teaches that the amount of component A (i.e., the water-soluble polymer) is between 40-95% by weight of the composition. By comparison, the amount of component (ii) (i.e., the water soluble polymer comprising at least one salt of a carboxylic acid group) recited in present claim 1 is between about 3% and 25% based on the total weight of the dispersant composition. Thus the water-soluble polymer of Mazanek et al. is present in a much greater amount, which is an amount well outside of the range recited for component (ii) of the dispersant composition of the present claims. In addition, Applicant believes that one of ordinary skill in the art would not reduce the amount of component A of Mazanek et al. since, as taught in this reference, it is known that the activity of dispersants has a significant effect on rheological properties of dispersions comprising them (see column 1, lines 51-59). Since the advantage identified by Mazanek et al. of the disclosed combination of dispersants is that the resulting dispersions have "improved flow properties" due to the synergistic effect of the additive combination of dispersants (see column 4, lines 44-49), one skilled in the art would not be motivated to use a dispersant composition that has much less of one of the critical components, with any expectation that similar improved properties would result.

Therefore, Applicant believes that claim 1 is patentable over Mazanek et al. since this reference does not disclose, teach, or suggest the combination of a polyalkylene oxide which is insoluble in water and a polymer comprising at least one salt of a carboxylic acid group which is soluble in water, particularly in the recited amounts. In addition, claims 3-6, 10-12, and 18, which depend directly or indirectly from claim 1, recite further embodiments of the present invention and, for at least the reasons discussed above, are also patentable over Mazanek et al.

Applicant therefore believes that claims 1, 3-6, 10-12, and 18 are patentable over Mazanek et al. and respectfully request that the rejection of these claims be withdrawn.

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Conclusion

In view of the foregoing remarks, Applicant believes that this application is in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue. If, in the opinion of the Examiner, a telephone conference would further expedite the prosecution of the subject application, the Examiner is invited to call the undersigned.

Respectfully submitted,

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